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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/823,035	04/13/2004	Ryuichi Kanamura	09792909-5864	3533
26263	7590	09/08/2005	EXAMINER	
SONNENSCHN NATH & ROSENTHAL LLP			VU, HUNG K	
P.O. BOX 061080			ART UNIT	
WACKER DRIVE STATION, SEARS TOWER			PAPER NUMBER	
CHICAGO, IL 60606-1080			2811	

DATE MAILED: 09/08/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/823,035

Applicant(s)

KANAMURA, RYUICHI

Examiner

Hung Vu

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 20 July 2005.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
- 4a) Of the above claim(s) 6-14 is/are withdrawn from consideration.
- 5) ☒ Claim(s) 3 and 4 is/are allowed.
- 6) ☒ Claim(s) 1, 2 and 5 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
 - 2) ☐ Certified copies of the priority documents have been received in Application No. _____.
 - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

1. Applicant's election of Invention of Group I, Claims 1-5, in the reply filed on 07/20/05 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).

Applicant's election without traverse of Invention of Group I, Claims 1-5, in the reply filed on 07/20/05 is acknowledged.

Claims 6-14 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected Invention, there being no allowable generic or linking claim.

Election was made **without** traverse in the reply filed on 07/20/05.

Claim Objections

2. Claim 5 is objected to because of the following informalities: In claim 5, lines 2-3, "the inter-wiring" should be changed to "an inter-wiring" for clarity. Appropriate correction is required.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1 and 5 are rejected under 35 U.S.C. 102(b) as being anticipated by Shimooka et al. (PN 6,534,870).

Shimooka et al. discloses, as shown in Figures 9 – 10C, a semiconductor device having a wiring structure, the wiring structure comprising:

- a lower buried-wiring layer (54);
- an interlayer insulating film (56) provided on the lower buried-wiring layer;
- an inter-wiring insulating film (57) provided on the interlayer insulating film; and
- an upper buried-wiring layer (59) buried in wiring grooves provided in the inter-wiring insulating film, the upper buried-wiring layer being electrically connected to the lower buried-wiring layer through contact plugs (55) passing through the interlayer insulating film;

wherein the interlayer insulating film is a first carbon-containing silicon oxide film (SiOC film), and the inter-wiring insulating film comprises a laminated insulating film including an organic or inorganic low dielectric constant insulating film (upper portion of 57), and a second carbon-containing silicon oxide film (SiOC film) (lower portion of 57) provided on the low dielectric constant insulating film, the second carbon-containing silicon oxide film having a lower carbon content than that of the first carbon-containing silicon oxide film (Col. 12, lines 55-61).

Note that the term “formed by a dual damascene method” is method recitation in a device claimed. “[E]ven though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the

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prior product was made by a different process.” *In re Thorpe*, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985).

Regarding claim 5, Shimooka et al. discloses the lower buried-wiring layer is buried in an inter-wiring insulating film (52) provided below the interlayer insulating film and comprising the organic insulating film (lower portion of 52) and the carbon-containing silicon oxide film (upper portion of 52) provide on the organic insulating film (Col. 12, lines 47-48).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Shimooka et al. (PN 6,534,870).

Shimooka et al. discloses the claimed invention including the semiconductor device as explained in the rejection above. Shimooka et al. does not disclose the carbon content of the second carbon-containing silicon oxide film. Although Shimooka et al. does not teach the content of the carbon, as that claimed by Applicants, however, it would have been obvious to one having ordinary skill in the art at the time the invention was made to form the carbon-containing silicon oxide film having a desired content, since it has been held that discovering an optimum value of

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a result effective variable involves only routine skill in the art. In re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

Allowable Subject Matter

5. Claim 3 and 4 are allowed.

6. The following is an examiner's statement of reasons for allowance:

Applicant's claims 3 and 4 are allowable over the references of record because none of these references disclose or can be combined to yield the claimed semiconductor device comprising the inter-wiring insulating film comprises a laminated insulating film including an organic or inorganic low dielectric constant insulating film, and a multi-layer second carbon-containing silicon oxide film provided on the low dielectric constant insulating film and having a plurality of layers with different carbon contents, the carbon content of the top layer of the second carbon-containing silicon oxide film being lower than that of the first carbon-containing silicon oxide in combination with the remaining claimed limitations.

Conclusion

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hung K. Vu whose telephone number is (571) 272-1666. The examiner can normally be reached on Tuesday-Friday 6:00-4:30, Eastern Time.

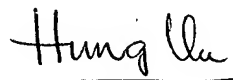
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If attempts to reach the examiner by telephone are unsuccessful, the examiner's acting supervisor, Steven Loke can be reached on (571) 272-1657. The Central Fax Number for the organization where this application or proceeding is assigned is (571) 273-8300.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

Vu

September 2, 2005

A handwritten signature in cursive script, appearing to read "Hung Vu", written in black ink.

Hung Vu

Primary Examiner